



Sounding Off

ADVENTURES IN REAL ASSETS INVESTING

By Brent Burnett, Managing Director

The foray through the Real Asset market can feel like Alice's experience in Lewis Carroll's "Alice's Adventures in Wonderland" -- without a plan in a strange land.

Alice finds herself struggling to make sense of this strange place while simultaneously dealing with unexpected surprises that always seem to derail her original plans. The deeper in she wades, the more confused she becomes and, stuck at a crossroads, seeks the advice of the Cheshire Cat, who, with his distinctive mischievous grin, engages Alice in a philosophical conversation regarding her objectives:

'Would you tell me, please, which way I ought to go from here?'

'That depends a good deal on where you want to get to,' said the Cat.

'I don't much care where--' said Alice.

'Then it doesn't matter which way you go,' said the Cat.

Carroll's classic tale often exemplifies what we see happening in the world of real assets when institutional investors wade through for the first time without a strategic plan. Successfully navigating this asset class can be difficult, and formulating a plan for

portfolio construction and execution is crucial. For the institutional investor that does not much care where it ends up, it doesn't much matter which path is taken. Those investors with clear portfolio objectives may achieve them with a clear plan.

Over the last couple of years, we have talked with a number of institutions that have experienced significant distress in their real asset portfolios as a result of excessive concentration in energy. These institutions were surprised that they "somehow" ended up with 60-70% of their real asset portfolios concentrated in a highly cyclical, commodity-driven industry. The lack of a cohesive and thoughtful portfolio plan suggests that they probably focused *exclusively* on manager selection without fully considering how their investments fit together in a portfolio construct. This approach usually results in simply buying what is being sold at the time rather than actively and selectively pursuing opportunities that will generate the long-term objectives for the portfolio.

Portfolio construction within real assets is especially difficult. Whereas many institutional investors include private

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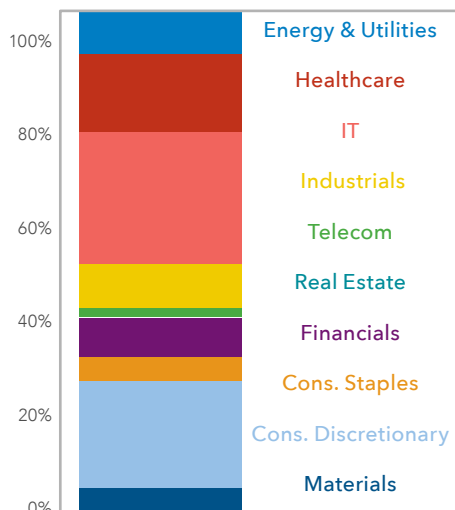
equity in a portfolio primarily for alpha generation, institutions may include real assets for any or all of the following reasons:

1. Alpha generation
2. Income generation
3. Inflation protection
4. Volatility reduction

Each of the subsectors within real assets, whether real estate, infrastructure or natural resources, can achieve those objectives depending on the specific strategies pursued.

In addition, under the real assets umbrella sits a collection of related, but distinct subsectors and investment strategies. Diversity in the portfolio requires effective selection and diversification across managers. Private equity may accidentally provide sufficient diversification, as these managers often invest across sectors or are agnostic to sectors as generalist investors, which the following chart exemplifies.

Private Equity Sector Allocation

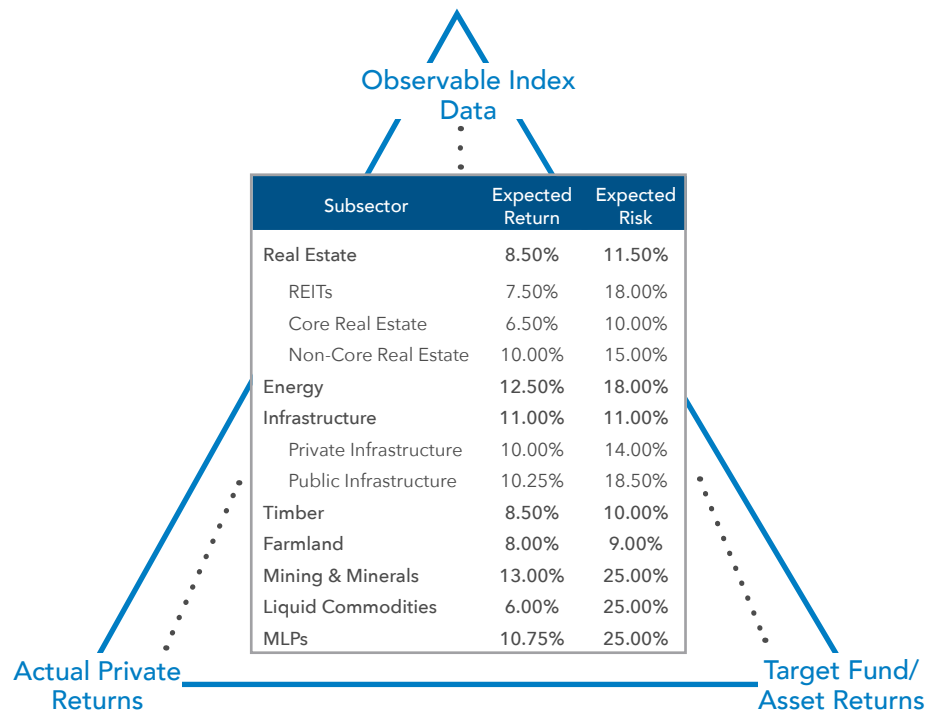


Source: Hamilton Lane Fund Investment Database, MSCI (August 2016)

In contrast, active sector diversification within a real assets portfolio is the responsibility of the investor. It is the investor who will determine how much real estate, energy, infrastructure, timber, agriculture or mineral exposure will be included in the portfolio. The investor will need to decide how these subsectors work together and compete on the margin for capital allocation.

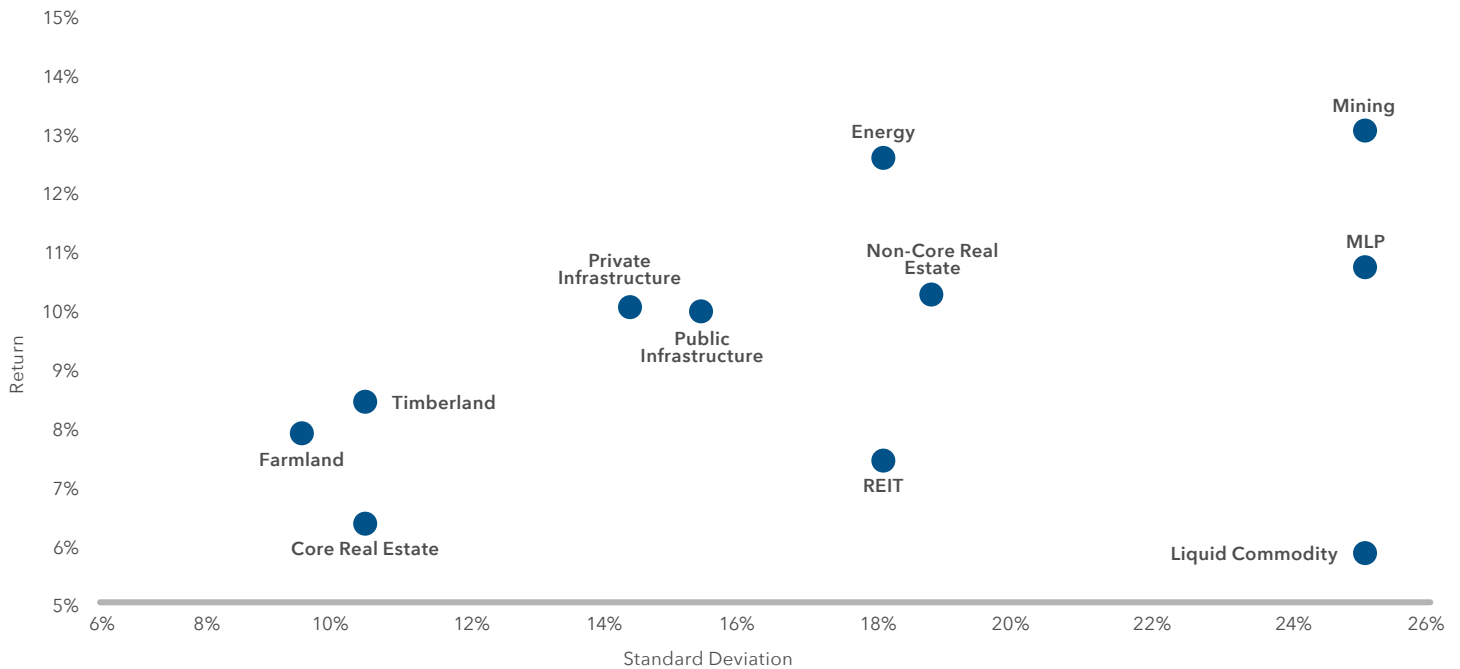
How then does an institutional investor approach real asset portfolio construction, and what are the limitations? When investors typically think of portfolio construction, they think of modern portfolio theory and, specifically, Mean Variance Optimization and its formulation of an Efficient Frontier. Given the return, volatility and correlation of distinct asset classes, Mean Variance Optimization seeks to construct an "optimal" portfolio that maximizes return for a given level of risk. However, the tools for Mean Variance Optimization that are typically involved in asset allocation decision making, both at the total portfolio level and the subsector structure of broader categories, have limitations when applied to private real assets.

Using a triangulation approach, Hamilton Lane develops forward-looking assumptions on how we expect subsectors to perform over a long-term time horizon (usually 10 years). It's important to keep in mind though, that these are just assumptions. The exercise of developing these assumptions forces us to think about each of the subsectors, and how they fit together in a diversified real assets portfolio. Our current assumption set for real assets is illustrated below:



¹ Please refer to endnotes on page 6 for information on the indices used

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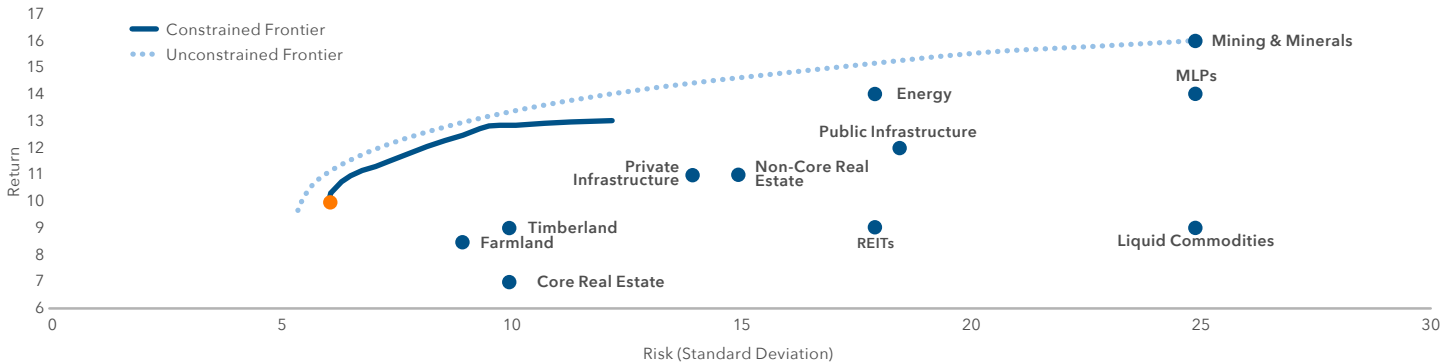
	REITs	Core RE	Non-Core RE	Farmland	Timberland	Public Infrastructure	Private Infrastructure	Energy	Mining	Liquid Commodities	MLP
REITs	1.00										
Core RE	0.13	1.00									
Non-Core RE	0.15	0.95	1.00								
Farmland	0.01	0.13	0.19	1.00							
Timberland	-0.10	-0.03	-0.05	0.39	1.00						
Public Infrastructure	0.71	0.19	0.26	0.07	-0.04	1.00					
Private Infrastructure	0.17	0.63	0.56	0.10	0.06	-0.03	1.00				
Energy	0.11	0.08	0.12	0.01	0.12	0.26	-0.25	1.00			
Mining	0.42	0.01	0.06	0.03	-0.07	0.68	-0.17	0.25	1.00		
Liquid Commodities	0.03	0.13	0.13	-0.18	-0.04	0.48	0.11	0.13	0.62	1.00	
MLP	0.42	-0.06	-0.02	-0.12	-0.22	0.72	-0.21	0.14	0.55	0.45	1.00

¹ Please refer to endnotes on page 6 for information on the indices used.

The assumption set provides a framework, and primary inputs, for us to begin evaluating different portfolio construction alternatives within real assets. Similar to how we develop assumptions, we think a triangulation approach to portfolio construction is best given the data limitations.

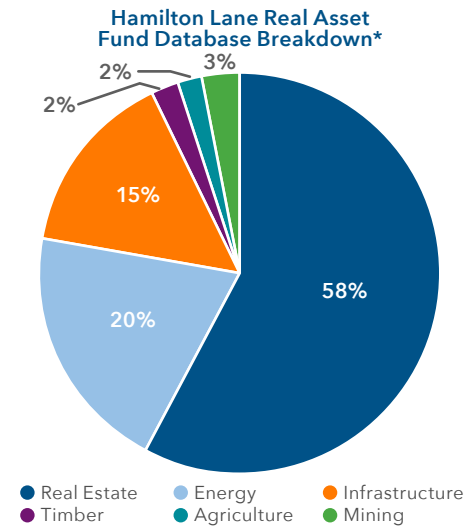
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However, left unconstrained, optimization models alone would suggest some unorthodox portfolio constructions and subsector concentrations.



¹ Please refer to endnotes on page 6 for information on the indices used.

As an example of biases that occur when constraints are not layered in (as measured by the NCREIF Timber and Farmland indices), timber and agriculture have experienced exceptional returns over the last 15 years with very low volatility. Left unconstrained, portfolio optimization models would suggest high concentrations of timber and agriculture in a real assets portfolio. However, real-world experience suggests that other factors should be considered when evaluating the relative attractiveness of these subsectors. For example, timber and agriculture have lower levels of liquidity, even relative to the other private real asset subsectors.



*Source: Hamilton Lane Fund Investment Database

In addition, we believe the investable opportunity set of these subsectors is much smaller, and as a result, the bench of top-quartile managers is much shallower than what is available in real estate, energy or infrastructure. The graphs to the right illustrate this point.

Sector	Real Asset Investable Universe (\$ Billions)	%
Real Estate	1,600	32.4%
Farmland	8	0.2%
Timberland	25	0.5%
Infrastructure	1,050	21.3%
Energy	1,300	26.4%
Mining	550	11.1%
Liquid Commodities	100	2.0%
MLP	300	6.1%
Total	4,933	100.0%

² Please refer to endnotes on page 6 for source and indices information

These opportunity set estimates illustrate a practical limitation for these specific subsectors: It is difficult for investors to build large-scale timber and agricultural portfolios relative to other subsectors in real assets.

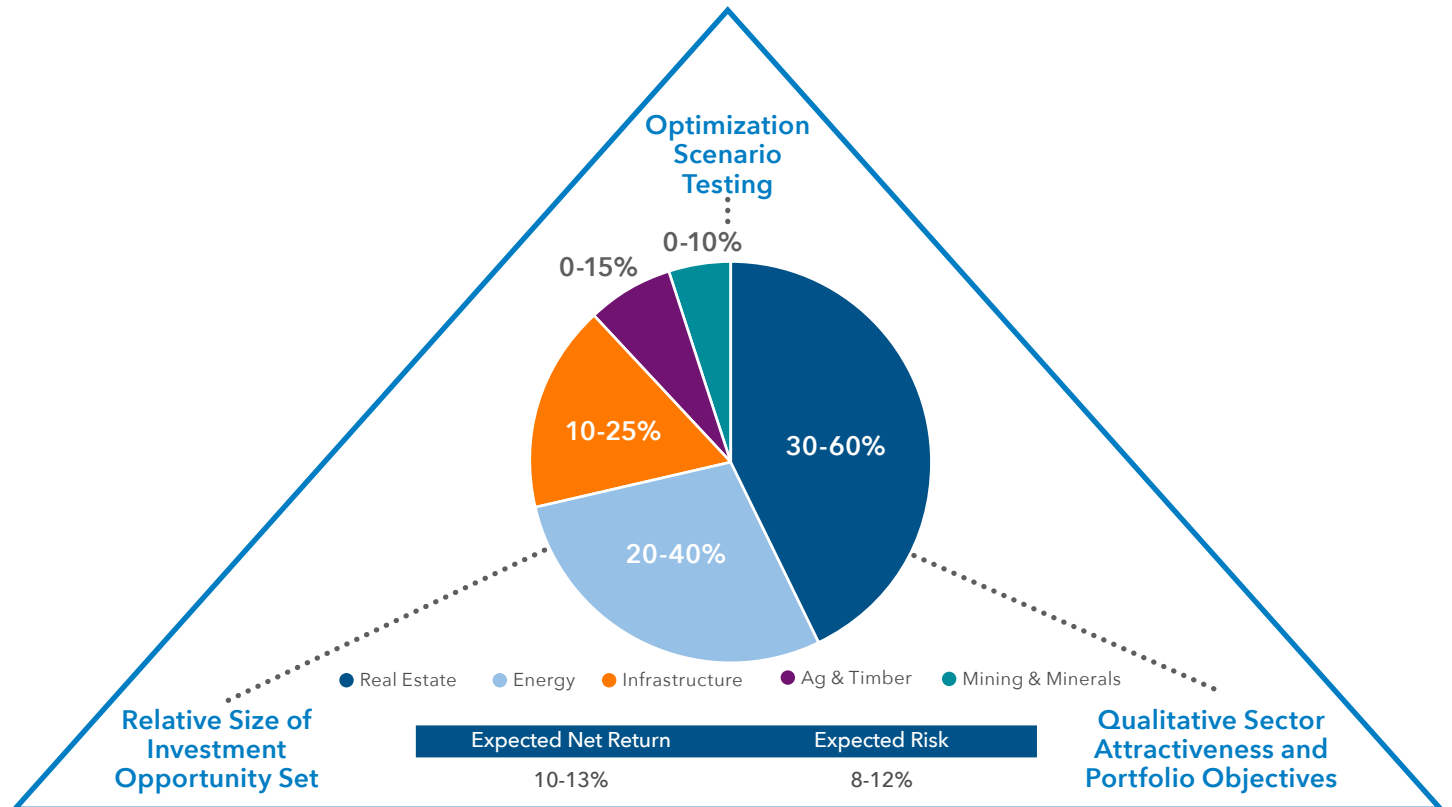
Given these limitations, we place qualitative constraints around the minimum and maximum exposures for each subsector when we run our optimization models. We try to make sure these constraints are broad enough to allow for some meaningful, analytically-driven differences across real asset portfolios while also being sufficiently constrained to result in portfolios that reflect reasonable diversification targets and any client-specific objectives.

This triangulation approach to portfolio construction results in target exposure ranges around each of the subsectors included in the portfolio.

These ranges provide for foundational exposure to the subsectors while also allowing sufficient flexibility to lean in or lean out of subsectors depending on relative subsector attractiveness over the investment time horizon.

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Again, the point of this exercise is to avoid false precision while also having a framework from which to evaluate real asset portfolio construction alternatives. In formulating a plan, we know we will be precisely wrong, but aim to be directionally correct in the construction of the portfolio.



The chart shown above was derived using the data provided in the chart on page 2.

Real assets are distinct in that the objectives of including them in an institutional portfolio can include return enhancement, volatility reduction, income generation or inflation protection. In addition, given the related but distinct subsectors within real assets, it is incumbent on the investor to actively pursue sector concentrations and resulting portfolio construction objectives.

As we have highlighted, there are real data limitations that prevent a purely quantitative approach to real asset portfolio construction. However, these limitations should not discourage us from having a framework consisting of both

quantitative analysis and qualitative judgment by which to evaluate real assets portfolio construction alternatives. Without a portfolio plan, like Alice, we are most likely to wander around for a while, and though we are sure to get somewhere, that somewhere is unlikely to be a place that we really want to be. 🌐

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Endnotes

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- ¹ Indices used: REITs- FTSE NAREIT Equity REITs Index; Core RE - NCREIF ODCE VW Index - Gross; Non-Core RE - NCREIF Property Index; Farmland - NCREIF Farmland Index; Timberland - NCREIF Timberland Index; Public Infrastructure - DJ Brookfield Global Infrastructure Index; Private Infrastructure - Preqin Infrastructure Index; Energy - A composite using 50% S&P 1500 Composite Energy Index, 25% S&P GSCI Natural Gas Index, 25% S&P GSCI Crude Oil Index; Mining - MSCI ACWI Metals & Mining Index; Liquid Commodities - S&P GS Commodity Index; MLP - Alerian MLP Index. Please see below for descriptions of the indices used.
- ² Indices used: Real Estate - composite of the Net Asset Value ("NAV") of the NCREIF Property Index, the NCREIF ODCE VW Index, and the market capitalization ("market cap") of the FTSE NAREIT Equity REIT Index; Farmland - NAV of the NCREIF Farmland Index; Timberland - NAV of the NCREIF Timberland Index; Infrastructure - Composite of the NAV of the private universe according to Preqin and the market cap of the DJ Brookfield Global Infrastructure Index; Energy - composite of the private universe based on the Hamilton Lane Fund Investment Database and the market cap of the exploration and production sector of the S&P Total Markets Index; Mining - composite of the private universe based on the Hamilton Lane Fund Investment Database and the market cap of the MSCI ACWI Metals & Mining Index; Liquid Commodities - the market cap of the S&P GS Commodity Index; MLP - the market cap of the Alerian MLP Index. Please see below for descriptions of the indices used.

The FTSE NAREIT All Equity REITs Index is a free-float adjusted, market capitalization-weighted index of U.S. Equity REITs. The NCREIF-ODCE is a capitalization-weighted, gross of fee, time-weighted return index with an inception date of December 31, 1977. The objective of the NCREIF Property Index is to provide a historical measurement of property-level returns to increase the understanding of, and lend credibility to, real estate as an institutional investment asset class. The NCREIF Farmland Index is a quarterly time series composite return measure of investment performance of a large pool of individual farmland properties acquired in the private market for investment purposes only. The NCREIF Timberland Index is a quarterly time series composite return measure of investment performance of a large pool of individual timber properties acquired in the private market for investment purposes only. The Dow Jones Brookfield Global Infrastructure Local Currency Index is designed to measure the performance of pure-play infrastructure companies domiciled globally. The Preqin Infrastructure Index, which captures in an index the returns earned by investors on average in their infrastructure portfolios, based on the actual amount of money invested in infrastructure partnerships. The S&P GSCI is a world-production weighted index that is based on the average quantity of production of each commodity in the index, over the last five years of available data. The MSCI ACWI Metals and Mining Index is composed of large and mid cap stocks across 23 Developed Markets (DM) countries and 24 Emerging Markets (EM) countries. The Alerian MLP Index is a float-adjusted, capitalization-weighted index, whose constituents represent approximately 85% of total float-adjusted market capitalization, is disseminated real-time on a price-return basis and on a total-return basis.



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